Demographics and the International Office Markets; Consequences for Property Portfolios

Demographics and the Global Office Market—Consequences for Property Portfolios

Executive Summary. *This study examines the effects of demographic changes on the global office markets. Growth in the labor force, the ultimate driver of office demand, is slowing down in some countries and is contracting in others. Based on demographic forecasts, expectations are formulated about the future shape of the office markets. The results suggest that office supply generally reacts accurately to changes in demand, but that this will be much harder if demand contracts harder than the write-off rate for offices. If office developers fail to incorporate these ongoing demographic shifts adequately, office portfolios might soon be confronted with structurally high vacancies, decreasing rents and falling values.*

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Introduction

In the last five decades, office markets have generally been characterized as growth markets: the population of working age has been steadily rising since World War II, and office employment has increased in a cyclical pattern around the path laid out by this growth. However, it is likely that this happy situation is a thing of the past, and that the future for the office market will be fundamentally different. The demographic numbers presented here suggest that the office markets are changing from growth markets into replacement markets.

Easterlin (1966) was among the first and few to notice the importance of demographic trends and changes when modeling economic fluctuations. Before dismissing the long swings as a statistical illusion, he advised model-builders to check the efficacy of their arsenal for the explanation of the observed waves of population growth, which, ex post, have been widely recognized as relevant to economic experience. The demographic consequences for property markets have only been investigated for housing. For the United States housing market, the (1989) article by Mankiw and Weil has triggered a lively but rather short debate of the potential effects of demographic changes. Based on a simple model of the relationship between housing demand and house prices, the authors predicted real house prices to fall substantially due to the end of the baby boom. Their conclusions were subsequently criticized by a number of authors, and after that, the investigation of

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demographic changes in the context of real estate markets has faded away.

Nevertheless, it is likely that demographics influence long-run trends in the demand for office space, which would make them a major driving force for the future of the office market. In the past, the demand for office space has been directly linked to employment in the service sector, since by-and-large a job created meant a job occupied. However, if the labor force will stop growing as a result of demographic low tide, this one-to-one link between employment growth and the need for new workspace may soften in the future. Job creation may then no longer lead to new demand for office space. That may imply that the current oversupply in many national office markets will not be solved as rapidly as has been seen in the past. This fundamental change in office market conditions has not yet received the research attention it deserves.

But the demographic changes are too fundamental to ignore. In many countries, the population group aged 18 to 65, the ultimate driver of office demand, has stopped growing, and in some countries it is already shrinking. It is difficult to argue that this will not affect the office markets. This paper tries to shed some light on the possible effects of these changes.

In order to disentangle the different aspects of these demographic developments, the paper is structured as follows. It begins with an international analysis of demographic trends, using data and projections of the United Nations for ten countries: Australia, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, the United Kingdom and the United States. The labor force of these countries is analyzed to detect trends across countries and through time.

The focus then turns to the office markets of the sample. Historic demand and supply statistics for office space in each country in the sample is examined. The unique sample of office data was supplied by LaSalle Investment Management. By linking these demand and supply statistics to the changes in rents and values, the study examines how office markets have behaved in the past. Historic variations in office markets are linked to demographic fluctuations in order to grasp the impact of the existing labor force forecasts. Based on these results, the study examines the future of the office markets in the sample. The paper ends with a discussion of the consequences of the findings for office portfolio management.

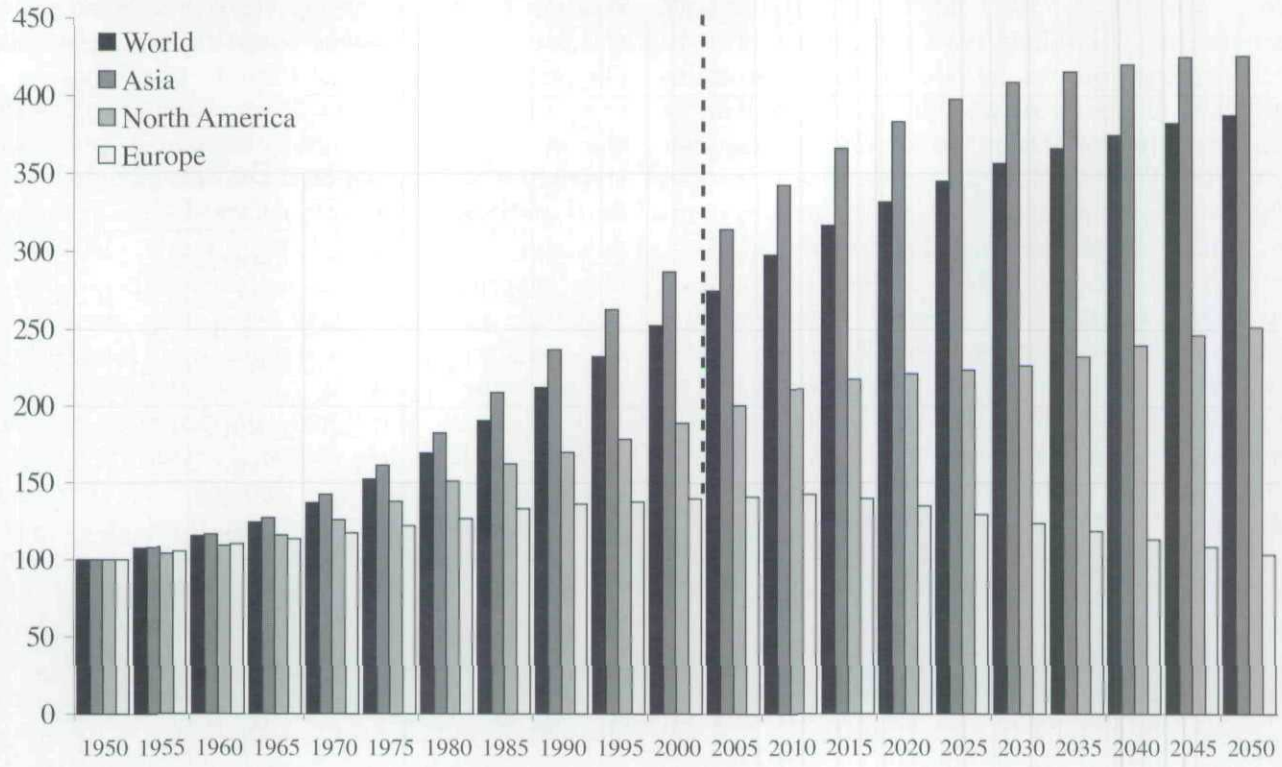
Global Demographic Developments and Labor Force Implications

The data regarding demographics are from the United Nations. The database entails annual historic numbers from 1950 and predictions until 2050 of the labor force: the number of people aged 18 to 65. Exhibit 1 provides the size of this age group for this 100-year period for Europe, North America, the Far East and the world as a whole. The graph clearly shows that the expected growth of the labor force depends on the continent one looks at.

In Europe, this age group has stopped growing and is about to decline. The amount of people aged 18 to 65 equaled approximately 463 million in 2000 and this number is expected to fall back to 343 million in 2050, but will not move very much between 2000 and 2015: the expected number of people in that age group is 463 million in 2015. This contrasts markedly with the situation for North America and the Far East, where labor force growth is expected to continue, albeit at a slower pace than these regions have become used to. The Asian labor force is expected to stop growing only around 2050, and will grow from 2000 levels of 2,135 million people to approximately 3,200 million in the steady state. For North America, a steady state in the labor force is not foreseen by current projections. The labor force is expected to grow with 65 million individuals to 260 million between 2000 and 2050. Until 2015, expected growth is 30 million.

This variation in demographic outlook does not only hold between continents, but also within them. To investigate these demographics further, labor force data will be examined for a sample of individual countries: Australia, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, the United Kingdom and the United States. Exhibit 2 reports historical labor force statistics and projections, again for the period 1950–2050. The exhibit

Exhibit 1
International Labor Force Statistics and Projections: Ages 18–65



The numbers have been indexed with 1950 as the base year. In 1950, the global labor force equaled 1.379 billion persons of which Europe housed 332 million, North America 104 million and Asia 744 million persons. Source: United Nations World Population Prospects Database.

Exhibit 2
International Labor Force Statistics

	Size '1,000'	Percentage Cumulative Growth		Percentage Average Annual Growth									
	2000	1950–2000	2000–2050	'50–'60	'60–'70	'70–'80	'80–'90	'90–'00	'00–'10	'10–'20	'20–'30	'30–'40	'40–'50
Australia	14,356	133.6	21.5	1.5	2.1	1.9	1.8	1.4	1.1	0.4	0.1	0.1	0.3
Canada	16,912	174.3	15.9	1.0	2.6	3.9	1.6	1.2	1.4	0.1	−0.4	0.2	0.2
France	36,320	41.3	−8.1	0.3	0.9	0.9	0.9	0.4	0.5	−0.3	−0.4	−0.4	−0.2
Germany	53,035	23.8	−27.9	0.7	0.0	0.3	0.9	0.2	−0.2	−0.3	−1.2	−1.0	−0.5
Italy	37,137	30.7	−34.3	0.8	0.5	0.4	0.8	0.2	−0.4	−0.7	−1.3	−1.9	0.0
Japan	82,200	84.3	−35.6	2.0	2.0	1.0	0.8	0.3	−0.5	−0.9	−0.6	−1.3	−1.1
Netherlands	10,244	74.2	−13.8	0.9	1.5	1.4	1.2	0.6	0.3	−0.2	−0.7	−0.7	−0.1
Spain	25,802	53.4	−41.1	0.8	0.7	1.1	1.2	0.6	0.0	−0.5	−1.1	−1.8	−1.8
U.K.	35,888	14.1	−16.2	−0.0	0.1	0.5	0.4	0.4	0.2	−0.2	−0.9	−0.3	−0.4
U.S.	174,872	83.1	28.8	0.8	1.4	1.8	1.1	1.1	1.1	0.5	0.1	0.4	0.4
Average	486,766	60.4	−4.4										
World	3,482,774	152.6	53.4	1.4	1.7	2.2	2.3	1.8	1.7	1.1	0.7	0.5	0.3

Notes: Labor force is defined as the national population in the age group of 18–65 years old. Percentages for the period 1950–2000 are historic statistics, while percentages for 2000–2050 are projections. Source: United Nations World Population Prospects Database.

shows that expected labor force growth until 2050 is much lower than the historic average over the decades since 1950. This holds for all the countries in the sample. Total cumulative labor force growth for these countries was 60.4% in the five decades until 2000, and is expected to be −4.4% until 2050. These growth rates are much lower than those for the world as a whole, which underlines the fact that the sample consists of relatively mature countries, both economically and demographically.

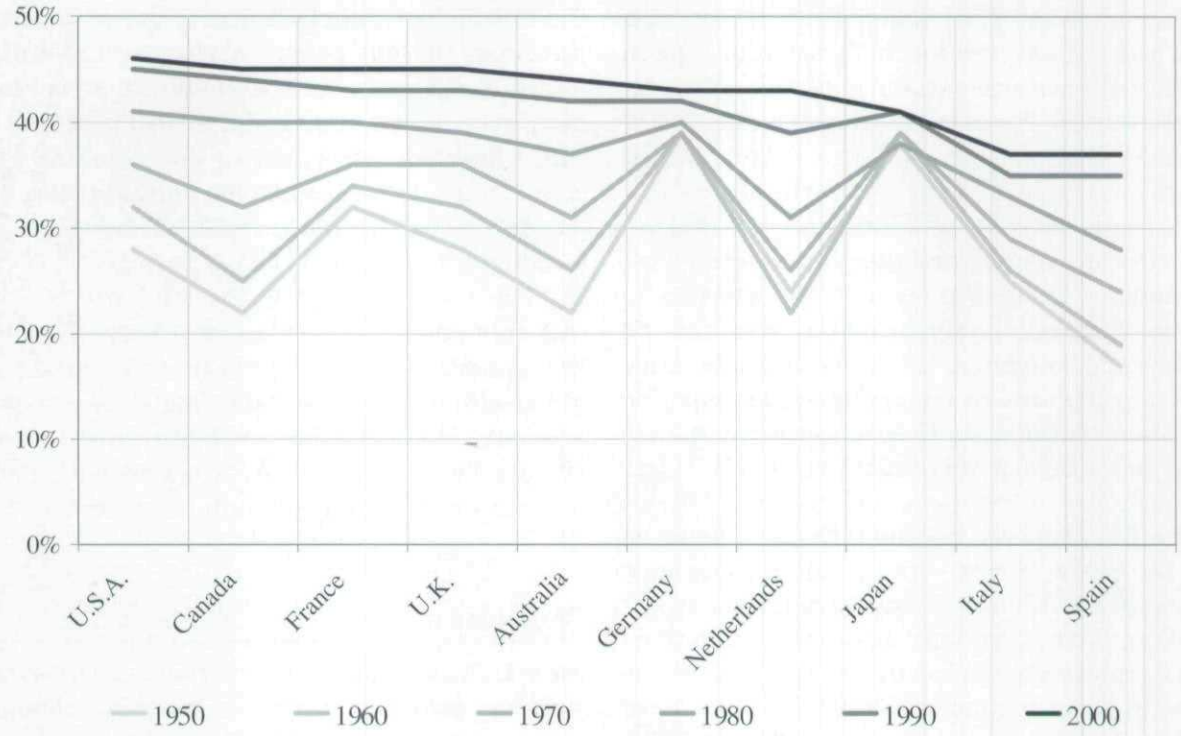
That notwithstanding, the extent of the historic and expected development of the labor force varies considerably across the countries examined. The U.S. seems to be the exception, with the labor force expected to increase 28.8% between 2000 and 2050. Compared to the historic cumulative growth of 83% for the fifty years before 2000, this does not seem like much, but it is the highest expected growth rate of any country in the sample. To what extent immigration drives this ongoing growth in labor population is not known, but it is striking that the only other countries where the labor force is expected to expand from current levels are the other countries in the sample where immigration has traditionally been important: Australia and Canada, with respective cumulative growth rates of 21.5% and 15.9%. But even for these countries, this is a fundamentally different situation than what they have experienced in the period since 1950.

In the sample, the country experiencing the most far-reaching demographic reversal is Japan. Its historic cumulative labor force growth of 84.3% is the third highest in the sample, while its expected labor force contraction is 35.6%, the strongest except for Spain. With Italy and Germany, Japan is already experiencing labor force contraction in the current decade. Demographically speaking, France, the Netherlands and the U.K. take a middle-position, with a more or less stable labor force in the next decade, and an expected contraction after that. However, that contraction is less severe than it is for Spain, Italy, Germany and Japan.

The historic demographic trends described above have been accompanied with structural changes in female participation in the labor force, and in order to judge the likely effects of the demographics, some of these changes must be taken into account. Exhibit 3 shows summary statistics obtained from the International Labor Organization, which display the development of female participation for the period 1950 to 2000. These numbers show that the proportion of female employees has grown strongly in all the countries in the sample, except for Japan and Germany, where female labor participation has been high historically. Growth has been especially strong in countries where the participation rate was low to begin with. As a result, the cross-country harmonization in female labor participation is now much stronger than it was in 1950. By 2000, the female participation rate was 46% in the U.S. and 45% in Canada, France and the U.K., which suggests that increased female labor force participation has run most of its course in these countries and will not provide an extra stimulus for the demand for office space like it has done in the past. This is all the more so since the growth in female labor participation has been slowing down in all countries in the sample during the last decade. That even holds for Spain and Italy, which have a relatively low female participation rate and may therefore be partly compensated for the demographic labor force contraction expected for these countries.

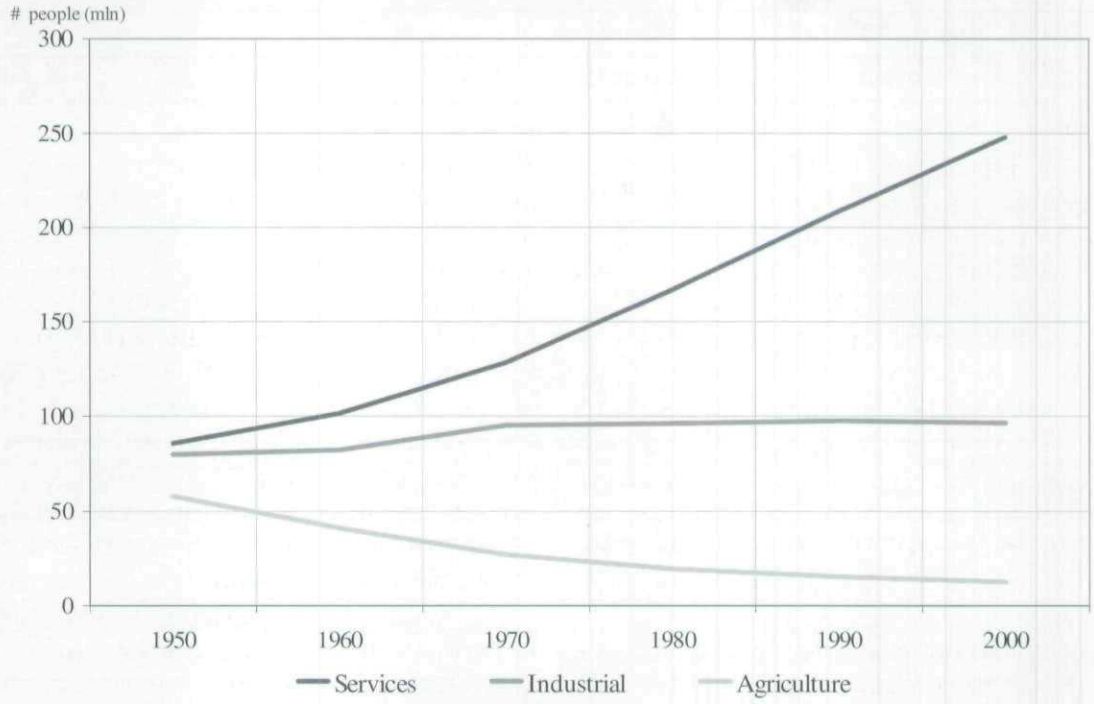
Of course not all of the labor force is working in office buildings and therefore the end of labor force growth will probably not affect the office sector proportionally. Therefore a brief analysis is included of the national labor force distribution across the main economic sectors: agriculture, industry and services. Exhibit 4 shows the aggregated number of people working in each of these sectors for the sample for the period 1950 to 2000.[1] These numbers indicate that employment growth in the mature economies in the sample has mostly been restricted to the services sector, especially when the period since 1970 is examined. By comparison, the number of people employed in industry in these countries has not increased very much in the last three decades, while the number of people employed in agriculture has strongly decreased. In other words, the growth of the labor force, both resulting from demographic forces and from increased female labor force participation,

Exhibit 3
Female Labor Participation: 1950–2000



The exhibit provides working women as a percentage of total working people.

Exhibit 4
International Employment Distribution across Sectors: 1950–2000



The exhibit provides the number of people working in the three main sectors for the sample countries.
Sources: International Labor Organization & OECD.

has been absorbed by jobs created in the services sector, and is therefore directly linked with increased demand for office space. That also suggests that an end to labor force growth will translate directly into the services sector, and will affect the demand for office space more than the demand for industrial space.

Overall, the labor force will stop growing and will even shrink in absolute numbers in various western economies. Future growth in the services industry is therefore likely to suffer from this decline. In some countries, this may partly be offset by a further increase in female labor participation, but in others, specifically France, Germany and Japan, the potential for this seems limited.

For the office property markets, the difference between an actual decline and a mere slowing of growth in the labor force may be fundamental. If a shrinking labor force implies decreasing demand for space, than supply growth will have to become negative in order to maintain current prices for office space. Due to the nature of real estate, it is much more difficult for supply growth to be become negative than merely to slow down. If the market fails to adjust supply, vacancy rates are likely to increase, thereby pressuring prices and rents. The market will move from a growth to a replacement market, and the effects of that will probably be noticed first and strongest in lower-quality real estate, since in replacement markets, low-quality products are usually replaced by high-quality products.

All this suggests that among mature economies, the American demographic situation is the exception, rather than the rule, and that the possible property market effects of labor force contraction should be empirically investigated with an international outlook rather than an American one.[2]

Modeling the Office Market

Research on office market dynamics is extensive and has provided insight in the way economic developments influence these markets (see Wheaton,

Exhibit 5
International Office Market and GDP Statistics: 1980–2000

	Real GDP-Growth		Office Market			
	Mean (%)	Std. Dev. (%)	Total Stock	Avg. New Space (%)	Avg. Vacancy (%)	Avg. Real Rent Growth (%)
Australia (Sydney)	2.92	2.68	3,778	2.01	7.44	1.84
Canada (Toronto)	2.29	3.05	12,566	3.06	11.24	−4.15
France (Paris)	2.03	1.61	29,214	2.44	5.67	2.22
Japan (Tokyo)	2.03	2.60	36,696	3.20	5.21	−0.55
Netherlands (Amsterdam)	1.80	3.15	4,919	3.36	7.31	1.73
Spain (Madrid)	3.23	2.28	9,770	1.89	4.77	0.78
U.K. (London)	2.42	2.22	16,335	1.39	7.42	0.13
U.S. (New York)	2.26	2.48	31,287	0.63	9.43	−0.31
(Los Angeles)	2.26	2.48	12,994	4.09	15.74	−2.46
(Chicago)	2.26	2.48	15,632	2.99	13.63	−1.99

Notes: Stock represents the total amount of completed office space in buildings mainly used for office purposes within a market that is capable of occupation regardless of the type of ownership or type of building quality, as at the survey date (normally at the end of each quarter). Stock includes both commercial and public sector offices, purpose-built offices, offices that have been structurally converted from other uses and independent offices that are part of mixed-use development. It excludes, however, ancillary offices within property that is predominantly used for non-office purposes (*e.g.* retail, distribution/warehousing or industrial uses).

Completions represent floorspace completed during the survey period (normally annually and projected forward by three years) within a market. Completions include both new development and refurbished accommodation that has been substantially modernized. An office is regarded as complete when the developer will undertake no further work until a tenant/occupier is secured. In the majority of instances this means that all main services are completed and suspended ceilings and light fittings are installed. Some developments are considered to be completed when they reach "shell-and-core" condition where the accommodation is to be marketed in that state. Sources: Jones Lang LaSalle and Datastream.

1987, 1999; and Kling and McCue, 1987). In these models, demand typically is a function of rents and employment. In an equilibrium market, economic growth will increase employment and thereby enhance the demand for office space, ceteris paribus. Supply of office space tends to be modeled as a function of development costs and future prices. The typical 'time to build lag' causes the construction of new office space to change with a lag and create discrepancies between supply and demand in the shorter run, which may influence office rents and prices in a cyclical way. Using vector autoregression, Kling and McCue show that the nominal rate of interest has the strongest influence on office construction. Through the cost of financing, a fall in interest rates directly reduces construction costs and increases anticipated output indirectly, thereby serving as a leading indicator of office supply. This relationship between nominal interest rates and office construction prevailed even in the late 1980s at a time when vacancy rates were increasing swiftly, and construction levels were still rising due to a decline in interest rates. This empirical evidence underlines the growing concern that future events are insufficiently incorporated in the planning of real estate construction. The retrospective focus on nominal interest rates is not likely to signal the demographic changes that are about to shift future demand for office space.

Wheaton (1999) proposed a stock-flow model of the office market, in which the demand for office space is subject to exogenous economic shocks. In Wheaton's (1999) model, a long-run increase in the demand for office space will proportionally increase the stock of that space. This requires the same rate of new construction, without the need for rents and prices to change. However, the question holds whether this model is realistic when demand contracts. Like the other existing office market models, the Wheaton (1999) model does not incorporate demographic variables. Instead, demographic changes are among the exogenous shocks that may drive demand. Moreover, empirical evidence of Kling and McCue (1987) suggests that this set of theoretical relationships does not hold in times of economic contraction. Real estate developers have strong survival incentives to maintain their activities even in times of high vacancy rates. Therefore, it is questionable as to whether the myopic planning horizons of real estate developers will support the conclusions of the stock-flow model in the current office markets.

Exhibit 6
Stock-Flow Correlations

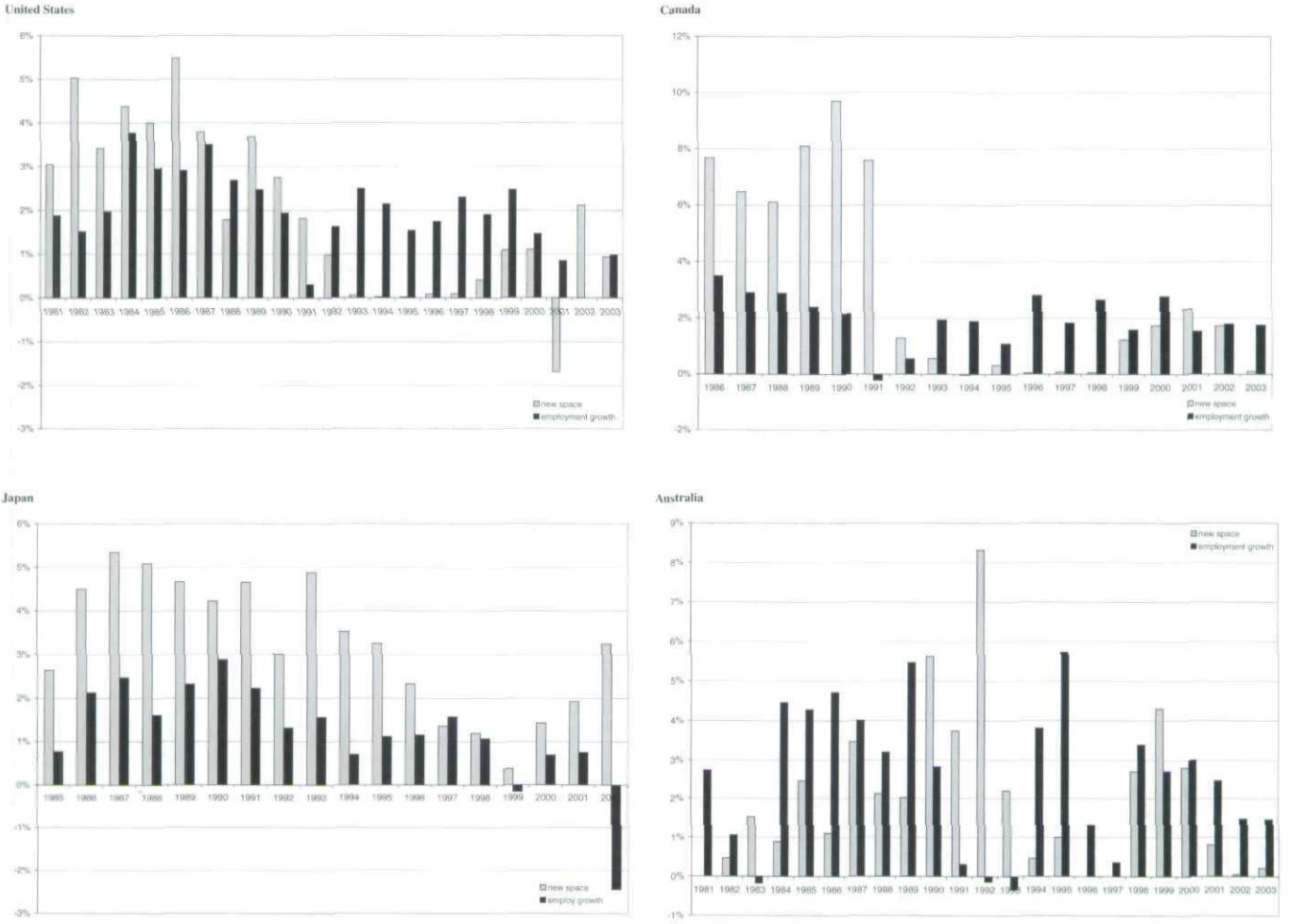
	Demand	*Supply*
Australia		
Rent	+0.01	−0.25
Employment growth	+0.37	+0.02
GDP growth	+0.30	−0.03
Canada		
Rent	−0.03	+0.57
Employment growth	+0.66	+0.57
GDP growth	+0.30	+0.37
France		
Rent	+0.08	+0.02
Employment growth	+0.57	+0.08
GDP growth	+0.64	+0.14
Japan		
Rent	+0.10	+0.28
Employment growth	+0.46	+0.49
GDP growth	+0.57	+0.40
Netherlands		
Rent	+0.00	+0.19
Employment growth	+0.35	+0.19
GDP growth	+0.43	+0.16
Spain		
Rent	−0.11	+0.55
Employment growth	+0.47	+0.60
GDP growth	+0.34	+0.38
U.K.		
Rent	+0.22	+0.12
Employment growth	+0.40	+0.44
GDP growth	+0.55	+0.21
U.S.		
Rent	−0.11	+0.07
Employment growth	+0.60	+0.44
GDP growth	+0.27	+0.20
Overall		
Rent	−0.03	+0.20
Employment growth	+0.49	+0.35
GDP growth	+0.44	+0.25

Notes: Demand is defined as the annual absorption of office space, while supply is measured as the annual completed square meters of office space as a percentage of the existing stock during the year.

Demographic Implications for the Office Market

To explore the demographic effects in the office markets, data supplied by LaSalle Investment Management was employed. The data cover office space, rents, vacancies, yields and new space and

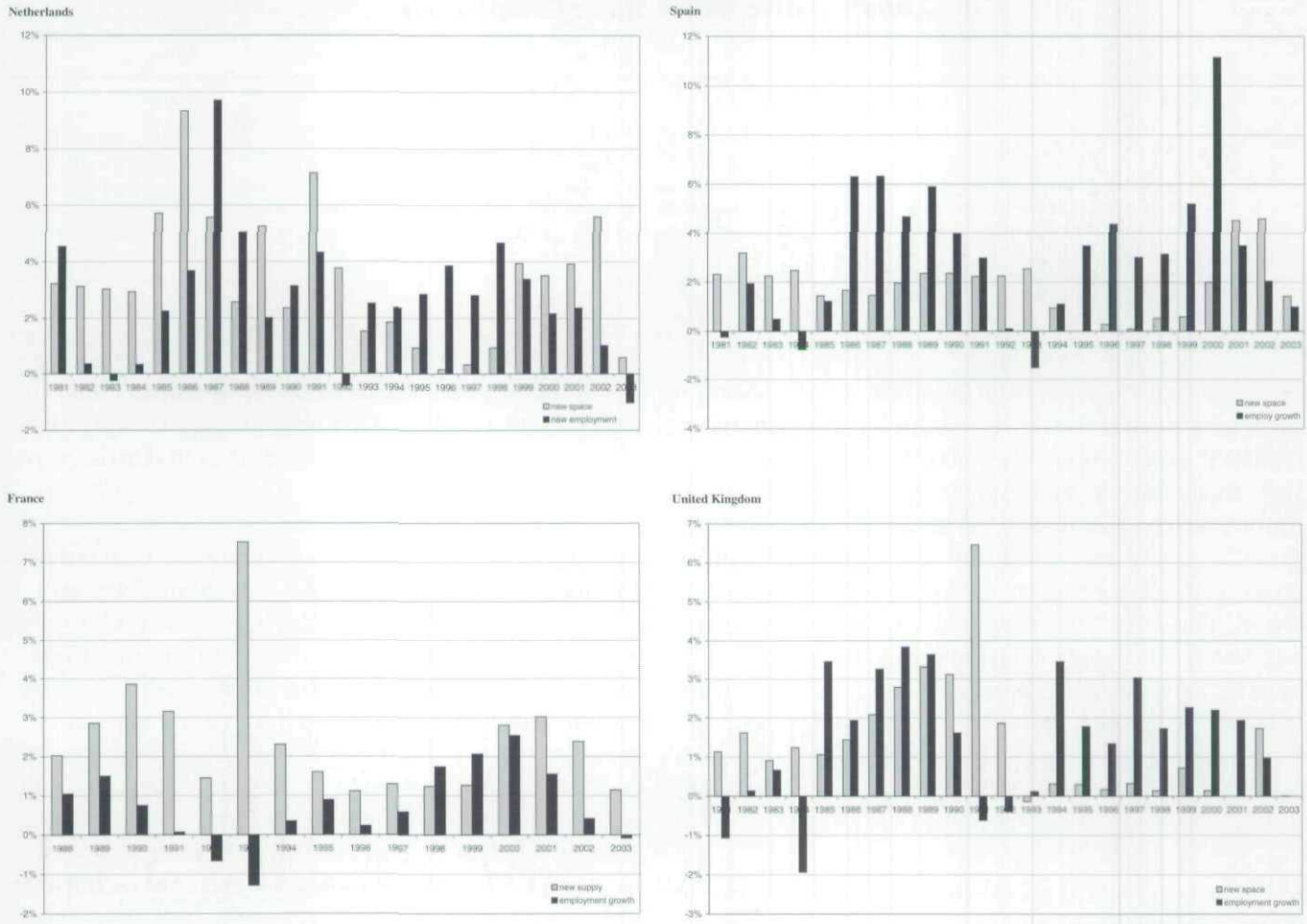
Exhibit 7
International New Space and Service Employment Growth over Time



are on the MSA level for the following cities: Sydney, Toronto, Paris, Tokyo, Amsterdam, Madrid, London, Los Angeles, Chicago and New York. The fact that the office market data are at another regional level of disaggregation than the demographic data may influence the results, but there is not much that can be done about this: international office market data is not available on a national level, and demographic data not on a city level.

Exhibit 5 provides office market statistics for the cities in the sample, presenting information regarding the stock of office space, average office completions and vacancy as a percentage of that stock, and average rents, as well as GDP growth. As one can see, the cross-sectional variation in these variables is generally considerable, but that does not hold for real GDP growth, which is just above 2% per annum and rather consistent across the countries in the sample. Spain (3.23%) and Australia (2.92%) do a bit better, while the Netherlands (1.80%) does a bit worse than the sample average. During the 1980–2000 period, relative office completions have been highest in Amsterdam, Tokyo and Toronto, while they have been lowest in London with an average of just 1.39% of the office stock per year. There seems to be a weakly positive relationship between growth in the labor force, as presented in Exhibit 2, and growth in office supply, as presented in Exhibit 5. For the countries in the sample, there is a Spearman rank correlation between the two variables of 0.19.

Exhibit 7 (continued)
International New Space and Service Employment Growth over Time



Source: Jones Lang LaSalle

With regards to vacancy, the U.S. and Canada lead the pack, with average vacancies during the sample period of more than 11%. Madrid, Tokyo and Paris have experienced average vacancy rates around 5%, not far removed from what would be considered the natural vacancy rate in the U.S. Finally, real rent growth has also varied considerably across the cities in the sample, showing a negative relationship with the average vacancy rate: the cross-country correlation between the two variables is −0.73. In Canada and the U.S., real rents have fallen during the 1980–2000 period, and in France and the Netherlands, where vacancy was lower, real rent growth has been in line with real GDP growth.

When confronting the office market numbers presented in Exhibit 5 with the labor force data reported in Exhibit 2, one does not see a clear relationship between them. For example, labor force growth between 1980 and 2000 was lowest in the U.S. and highest in Australia and Canada, but cities in Canada and the U.S. share a pattern of high vacancy and real rent contraction, while Sydney has real rent growth and lower vacancy. It looks as if the growth in new supply has played a much bigger role: cities where supply has been substantial have higher vacancy and lower rents. The cross-country correlation between supply growth and vacancy was 0.43 and between supply growth and real rent growth −0.37.

Exhibit 8

Contemporaneous and Lagged Correlations between Service Employment Growth and Relative Office Space Completions

	U.S.	Canada	Spain	Japan	NL	Australia	U.K.	AVG
Contemporaneous	0.43	0.16	−0.17	0.49	0.19	−0.13	−0.08	0.13
1-year lag	0.39	0.49	0.31	0.55	0.04	0.05	0.21	0.29
2-year lag	0.44	0.58	0.61	0.43	−0.13	0.03	0.44	0.34

Notes: The correlation coefficients measure the relationship between the growth in service employment (annual number of jobs) and the relative annual completions of office space, both contemporaneously and with lagged employment growth in order to capture the time to build lag.

To investigate these relationships a bit deeper, a correlation analysis was conducted on the international office series (see Exhibit 6). In line with the stock-flow model, a positive relationship is found between real GDP growth and employment growth on the one hand and the demand for office space, as measured by office absorption, on the other. The numbers reported in Exhibit 6 do not suggest a consistent relationship between real rent growth and demand, which is not in line with intuition. There is a mildly positive relationship between employment growth and GDP growth on the one hand and supply of office space on the other hand.

In Exhibit 7, the general labor force is narrowed down to services employment sector and confronts these with the completions in the international office markets. The graphs provide information regarding service employment and office completions on an annual basis for 1980 to 2000. The graphs suggest that there is indeed a positive relationship between the two variables, but that it is not contemporaneous.

Of course, given the time-to-build lag, a purely contemporaneous analysis would not be expected. Therefore, the analysis is conducted by studying lagged correlations between service employment growth and office completions, which are reported in Exhibit 8. Generally, the correlations go up with increasing lags. With the exception of the Netherlands and Australia, where the correlations are around zero, the correlation between service employment and lagged office space completions is around 0.50, and statistically significant. That suggests that the office market generally reacts rather efficiently to changes in demand, even if that reaction is not immediate.

However, these relationships have all been investigated in a period in which the labor force in all the countries in the sample has been growing. A shrinking labor force will alter the picture fundamentally and it may be labor force growth and not employment growth that will drive the demand for office space. In countries where labor force growth is merely slowing down or where it is only contracting slightly, office supply may react to the structural decrease in demand. Indeed, the correlations presented in Exhibit 8 suggest considerable elasticity, so it is likely that supply will slow down. However, if the demand reduction outpaces the rate at which offices are written off, price decreases are probably inevitable. When using the labor force forecasts of Exhibit 2 as a proxy for future office demand, countries like Italy, Germany and Spain are most likely to face this situation in the next decades.[3]

Discussion and Consequences for Portfolio Management

This paper has attempted to investigate the effects of structural demographic changes on some of the major office markets around the world. The findings indicate a significant relationship between lagged employment growth and the new supply of office space. However, a shrinking labor force will likely alter this relationship and it may be labor

force growth and not employment growth that will drive the demand for office space.

In that new demographic situation, either the supply of office space will have to adjust to the new demand situation, or prices of office space will fall. If demand growth would just slow down, Wheaton's office market model and the empirical analysis presented here suggest that supply would react adequately, and rents and prices would not have to fall. When demand actually falls, and falls harder than offices are normally written off, that will be much harder to accomplish: part of the stock of office space will have to disappear, or be converted into something else. This will take a lot of time and will be very costly, and rents are likely to fall before such an adjustment is completed. Moreover, the question is not so much whether the demographic effects investigated in this study have negative consequences for the global office markets, but more about who will have to carry the burden. When the labor force contracts, supply reacting adequately is another phrase for builders and developers going bankrupt, while supply reacting inadequately means investors performing badly.

These consequences all indicate that portfolio managers should be careful when investing in the office market. On the whole, developers and investors with development activities will probably be affected first and strongest by the change in the demographic tide. Moreover, the findings suggest that the speed and degree to which demographics will cause lower demand for office space vary considerably across countries. In most European countries, the labor force has stopped growing, and will start shrinking in the next decade. In other countries, like Japan and Germany, the labor force is already contracting. This contrasts markedly with the situation in the U.S., Australia and Canada, where labor force growth is expected to continue, albeit at a somewhat slower pace than was common during previous decades. This also holds for emerging markets, which may increase their long-run attractiveness for office investors.

Several factors may alter these conclusions. First, if companies in the service industry have structural problems in filling vacant jobs, they may look for employees abroad. For traditional immigrant nations like the U.S., Australia and Canada, this is nothing new, but even in Europe, which has traditionally been more protective for its labor markets, steps towards more immigration are visible. Bundeskanzler Schröder of Germany, for example, has announced that his country is actively seeking highly trained people for its software industry abroad. The enlargement of the European Union will probably stimulate this development, with net migration from the new member states to make up for the shrinking labor force in the existing member countries. However, that will only mean that the problem is exported to the countries from which these people emigrate. The implications of this are that Central and Eastern Europe could well be less interesting for office investment than is currently believed: even if income levels in these countries will grow to Western European levels, the working people for whom these offices are ultimately built could well have gone West.

Second, labor force contraction may be kept at bay by structural changes in social security systems. Broad discussions to raise the legal pension age are already underway in the countries for which the demographic situation is acute. Also, in countries with structurally high unemployment or a sizeable part of the potential labor force disabled, the shrinking labor force may provide stronger incentives to do something about it. For example, maintaining disability insurance at current levels will probably be unaffordable. This will likely mean lower benefits, increasing the incentives for people to leave the social security system and get back to work. Nevertheless, the current pace of social security reform is such that it may take a long time before these measures will have an effect on the labor force.

Third, the amount of office space per worker may shift upward in a structural way to absorb the stock of office space when the labor force contracts. Given the current trend for companies to decrease the amount of space for employees, however, the chances of this happening are slim and even if so will not prevent office rents from falling. Indeed, office space per worker will probably only increase

in reaction to decreasing rents, but will not preclude the decrease from happening.

Fourth, the demographic and employment statistics used in this study are on the country level, but it is very unlikely that the structural changes documented will be spread evenly across cities and regions in these countries. Migration flows within these countries may well distort the picture and it is very likely that some regions will still be able to attract people and will therefore buck the demographic trend. In that regard, a look at history is illuminating. Against a trend of a decreasing population for the country as a whole, the city of Amsterdam was able to maintain its population size until the end of the eighteenth century through migration, while other Dutch cities had seen their populations shrink and their economies decline decades before. The housing rents in these cities reflected this situation.[4] However that will only deepen the problems for the remaining cities. For portfolio management, this means that it will be even more important to pick the right regions than in the past, as there will be more variance in the fortune of the office market across regions and cities.

Endnotes

1. The national numbers were abrogated into an international indicator.
2. We acknowledge the internationalization trend in real estate markets. Companies in the U.S. are likely to expand their foreign activities as are European companies expanding their U.S. activities. But since the vast majority of the European real estate markets are occupied by domestic firms, the focus of this study is on investigating the relationship between the economy and the office market on a national level.
3. This conclusion is supported by recent research on demographics by Deutsche Bank Research, which formulates a similar gloomy picture for the German office market for the next twenty years.
4. See for historic demographic information regarding Amsterdam, see De Vries and Van der Woude (1995).

References

Deutsche Bank Research, *Current Issues: Demography Special*, September 26, 2003.

Easterlin, R. A.., Economic-Demographic Interactions and Long Swings in Economic Growth, *American Economic Review*, 1966, 61, 1063–1103.

Kling, J. L. and T. E. McCue, Office Building Investment and the Macroeconomy: Empirical Evidence, 1973–1985, *Journal of the American Real Estate and Urban Economics Association*, 1987, 15, 234–55.

Mankiw, G. N. and D. N. Weil, The Baby Boom, the Baby Bust and the Housing Market, *Regional Science and Urban Economics*, 1989, 19, 235–58.

Vries, J. de and A. van der Woude, *Nederland 1500–1815; De eerste ronde van moderne economische groei*, Uitgeverij Balans, Amsterdam, 1995.

Wheaton, W. C., The Cyclic Behavior of the National Office Market, *Journal of the American Real Estate and Urban Economics Association*, 1987, 15, 281–99.

Wheaton, W. C., Real Estate "Cycles": Some Fundamentals, *Real Estate Economics*, 1999, 27, 209–30.

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